

REMARKS

Reconsideration of this application, and the rejection of claims 1-13 are respectfully requested. Applicant has attempted to address every objection and ground for rejection in the Office Action dated February 13, 2002 (Paper No. 4) and believes this application is now in condition for allowance. The claims have been amended to more clearly describe the present invention.

In the Office Action, the drawings stand objected to as failing to designate prior art and failing to include a reference number 42. The drawings were amended to correct informalities and to designate prior art. Specifically, the substitute drawings have been corrected to indicate Figures 1, 2 and 3 to be prior art. Figure 1 was amended to contain reference number 42 as indicated in the description. Applicant submits the objection has been overcome. Notice to that effect is requested.

The specification stands objected to due to informalities. The specification was amended to correct the brief description of figures and to include a reference to the Figure 5. Page 5, lines 7-10 of the brief description of the drawings are objected to because Figs. 2 and 3 should be designated as prior art. By this amendment, the brief descriptions of Figs. 2 and 3 were amended to indicate a description of prior art. Fig. 2 was amended to describe "a cross sectional view of prior art illustrating the operation of the switch used for conducting signal;" and Fig. 3 was amended to describe "a partial exploded view of the prior art segment, in which the segment is shown up side down." As to the objection of page 5, line 19 of the brief description of the drawings as being an inaccurate description of Fig. 8, Applicant amended the

description of Fig. 8 to describe “a perspective view of the dart of the present invention.” Further, page 6, line 3 of the detailed description is objected to as describing matter (main body 110) not shown in referenced Fig. 4. The paragraph beginning on page 6, line 3 was amended to delete the reference to main body 110. Further still, page 6, line 19 of the detailed description is objected to as failing to refer to the corresponding figure being described. The paragraph beginning on page 6, line 19 was amended to include a reference to Fig. 5. Accordingly, the objections to the specification are respectfully traversed. Notice to that effect is requested.

Further, claim 12 stands objected to as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant cancels claims 12 and 13, without prejudice. Accordingly, the objections to claims 12 and 13 are respectfully traversed.

With respect to the rejection of claims, claims 1-3, 5, and 8-12 stand rejected under 35 U.S.C. 102(b) as being anticipated by Fuscone (GB 2086243) and claims 4 and 6 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Fuscone. Further, claims 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuscone in view of Clark (U.S. Patent No. 4,768,789).

With respect to the rejection of Claims 1-3, 5 and 8-12 under 35 U.S.C. §102(b) as being anticipated by Fuscone, Applicant submits that the amendment to Claim 1 overcomes the rejection under 35 U.S.C. §102(b) and places the application in condition for allowance. Notice to that effect is requested.

Fuscone discloses a scoring system with a plurality of inductance coils (FIG 2, reference 4 and page 1, lines 125-129) connected to the electronic scoring means (FIG 5). An inductor core is surrounded by a bobbin and the inductor coil (page 1, lines 125-129). Additionally, the frame with the coils is disposed in the back of the main body (Abstract, lines 4-7). The dart does not enter the inductor coil but travels in the vicinity of the inductor core. Moreover, since the inductor coil has an inductor core within the coil, the dart cannot move through the coil.

Amended Claim 1 of the present invention recites, among other things, an electronic dart game comprising “each of said coils is associated with a corresponding one of said scoring areas and defines a scoring signal zone,” and “a scoring signal is generated by said dart entering said scoring signal zone, said signal is transmitted to said electronic scoring means.”

This feature is not disclosed by Fuscone. More specifically, Fuscone does not disclose “each of said coils...defines a scoring signal zone” and “a scoring signal is generated by said dart entering the scoring signal zone.” Fuscone does not disclose the dart entering the inductance coil. Further, Fuscone neither teaches nor even suggests that the frame provided with inductance coils can be arranged in front of or within the main body allowing a dart to enter the coil. In view of the foregoing, Applicant submits Claim 1, as amended, overcomes the rejection under 35 U.S.C. §102(b). Accordingly, the rejection of claims 1-3, 5 and 8-12 under 35 U.S.C. §102(b) have been overcome and should be withdrawn. Notice to that effect is requested.

Claims 4 and 6 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Fuscone. Fuscone does not teach or suggest the game as recited in amended claim 1, including, among other things, "each of said coils is associated with a corresponding one of said scoring areas and defines a scoring signal zone," and "a scoring signal is generated by said dart entering said scoring signal zone, said signal is transmitted to said electronic scoring means." In view of the amendments to claim 1 traversing the rejection under 35 U.S.C. §102(b), the rejection of claims 4 and 6 under 35 U.S.C. §103(a) is respectfully traversed.

Claims 7 and 13 are rejected under 35 U.S.C. §103(a) as being unpatentable over Fuscone in view of Clark (US Patent No. 4,768,789). Fuscone does not teach or suggest the game as recited in amended claim 1, as discussed above. Clark merely teaches that connections must be connected to the same lines in order for the total number of scoring positions on the dartboard to be accounted for (Column 4, lines 26-29). Clark, whether taken alone or in combination with Fuscone, does not teach or suggest, however, a plurality of coils corresponding to different scoring areas representing the same scoring value being wired together. More specifically, Clark does not teach the specific way that the connections of the present invention are being made. According to the amendments of claim 1 under 35 U.S.C. §102(b), the rejection of claims 7 and 13 under 35 U.S.C. §103(a) is respectfully traversed.

In view of the foregoing remarks and amendments, Applicant respectfully submits the rejections under 35 U.S.C. §103(a) have been overcome and should be withdrawn. Notice to that effect is requested.

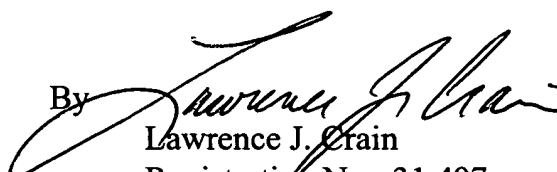
Claims 2-11 depend from claim 1. These claims are further believed allowable over the references of record for the same reasons set forth with respect to their parent claim since each sets forth additional structural elements and novel steps of Applicant's invention.

New claims 14 and 15 are submitted to be distinguishable over Fuscone taken alone or in combination with any other reference of record. Allowance of the claims is respectfully requested.

Applicant submits that in view of the above-identified amendments and remarks, the claims in their present form are patentably distinct over the art of record. Allowance of the rejected claims is respectfully requested. Should the Examiner discover there are remaining issues which may be resolved by a telephone interview, she is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

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ELECTRONIC DART GAME

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Field of the Present Invention

The present invention relates to an electronic dart game, particularly to a dart
5 game with improved performance based on the principle of electromagnetic induction.

Background of the Invention

Traditionally, a dart game is scored manually. In recent years, electronic
dartboards have become popular as scoring can be done automatically by providing an
electronic scoring means in those dart games. For example, US Patent No. 6,089,571
10 discloses an interesting electronic dart game, as shown in Fig. 1. In the material of
prior art, the surface of a dartboard is divided into several independent scoring
sections 42. Each scoring section 42 is loosely attached to the dartboard and
electrodes of a switch provided respectively on conductor sheets 31 and 33 is under
each scoring section 42. When a dart (not shown) hits a specific scoring section 42 on
15 the dartboard, the impact causes the section 42 to push against the electronic switch
underneath, thus, ~~sending~~ send an electronic signal to an electronic scoring machine
10.

According to the disclosure of the prior art, referring to Fig. 2, the slide 70 and
the block 80 may be moved inward of the frame 40 against the springs 74 when the
20 block 80 is shot by a dart 88. Obviously, the structure of the prior art for arranging the
conductor means is complex and it is not very easy to mount as its precision for
locating switch on resilient sheets 31 and 33.

In addition, since the individual sections on the surface of the dartboard of the prior art are provided to be attached on the dartboard, the drawbacks of the prior art are also difficult to overcome. Referring to Fig. 3, the slides 70 each ~~include~~includes one or more pins 71 for engaging into the block 80 and for securing the block 80 to the slide 70. Thus it is easy to understand that the attachment between blocks 80 and the dartboard are not ~~in firmness manner~~ secure and it can cause ~~other~~others drawbacks. Firstly, ~~When~~when a dart hits a specific section on the dartboard, other sections on the dartboard may also vibrate and may trigger other membrane switches;. Thusthus it not only causes confusion in scoring, but also the player can not have the same satisfactory sensation in comparison with an ordinary dart game. Secondly, removing a dart from any unstable section is not very easy.

Summary of the Invention

An object of the present invention is to provide an electronic dart game having a plurality of inductance ~~coil~~seil and a magnetic dart to be used for scoring.

Another object of the present invention is to provide a method of automatic scoring for a dart game based on the principle of electromagnetic induction.

To achieve the above ~~purposes~~purpose, there is provided an electronic dart game comprising a dart; a dartboard, provided with a frame, formed a plurality of scoring areas by a plurality of radial spiders and circumferential spiders which are arranged crossly and a main body for being shot by the dart, attached with the frame; and an electronic scoring means for displaying signals collected from the scoring areas, wherein the dart game comprises a plurality of inductance coils with

predetermined turns, with the frame and connected to the electronic scoring means through cables; and the dart is provided with a magnetic substance.

5 In accordance with the present electronic dart game, ~~the~~ a plurality of inductance coils are provided with predetermined shape to be engaged with the scoring areas.

In accordance with the present electronic dart game, a cross-section of each turn of the inductance coil matches and is smaller than that of the scoring areas.

In accordance with the present electronic dart game, the frame provided with the inductance coil is arranged in front of the main body.

10 In accordance with the electronic dart game, the frame provided with the inductance coil is arranged in back of the main body.

In accordance with the electronic dart game, the frame provided with the inductance coil is arranged in the main body.

15 In accordance with the electronic dart game, a plurality of the coils ~~corresponding~~ corresponded to different scoring areas representing the same score, are wired together before being connected to the electronic scoring means.

In accordance with the present electronic dart game, a point of the dart is provided with a magnetic substance.

20 In accordance with the present electronic dart game, a slender shaft of the dart is a magnetic substance.

In accordance with the present electronic dart game, the point and slender shaft of the dart are integrated and magnetized simultaneously.

In accordance with the present electronic dart game, the main body of the dartboard is made of bristle, natural fiber, synthetic fiber, plastic or the combination thereof.

5 A method of automatic scoring for an electronic dart game, comprises the steps of: dividing a dartboard into a plurality of areas by utilizing a frame and establishing a score for the each areas; attaching a main body for being shot by a dart to the frame; providing a plurality of inductance coils in predetermined shape engaged with the areas on the frame and connecting the coils to a scoring means of the dart game; magnetizing a point and slender shaft of the dart for changing distribution of
10 magnetic field of the inductance coil at the moment of the main body of the dartboard being shot by the dart.

In accordance with the present method comprises the steps of providing a cross section of the each turn of the inductance coil to be smaller than that of the related areas; and wiring the coils representing the same score all together before
15 being connected to a electronic scoring unit.

In one aspect of the present invention, the present dart game has a stable one-piece surface so that the player has a similar satisfactory sensation as shooting onto a classical one-piece dartboard.

In another aspect of the present invention, as a plurality of
20 electromagnetic induction coils are firmly attached to the stable one-piece surface, the electronic scoring signal is generated only at the moment of the dart hitting the scoring areas on the dartboard, thus the chances for an erroneous signal to occur is very slim.

In accordance with a further aspect of the present invention, the dart is easier to remove from the dartboard in comparison with the electronic dart game of the prior art.

5 Brief Description of the Drawings

With reference to the following drawings, the preferred embodiments of the present invention shall be illustrated in detail.

Fig. 1 is an exploded view of an electronic dart game of the prior art;

Fig. 2 is a cross sectional view illustrating the operation of the switch used for
10 conducting ~~signal~~signal;

Fig. 3 is a partial exploded view of the segment, in which the segment is shown up side down;

Fig. 4 is a perspective view of the dartboard of the present invention, showing a frame formed by a circumferential and radial spider;

15 Fig. 5 is a partial ~~schematics~~sketch view of a preferred embodiment of the dartboard of the present invention, shown receiving a ~~on which is shot by the dart~~;

Fig. 6 is a partial ~~schematics~~sketch view of another embodiment of the dartboard of the present invention, shown receiving a ~~on which is shot by the dart~~;

Fig. 7 is a partial ~~schematics~~sketch view of a further embodiment of the
20 dartboard of the present invention, shown receiving a ~~on which is shot by the dart~~; and

Fig. 8 is a perspective view of the ~~dartboard~~ of the present invention.

Description of the Preferred Embodiments

The present electronic game ~~include~~~~se~~~~empr~~ise a dartboard having a number of scoring areas for being shot at by a player and an electronic scoring means for displaying signals collected from the scoring areas.

5 Now referring to Fig. 4, the dartboard of the present invention includes a frame 100 ~~and main body 110 attached to the frame 100~~. A plurality of scored areas 102 is formed by a plurality of ~~circumferential~~~~radial~~ spiders 106 and ~~radial~~~~circumferential~~ spiders 104 which are arranged crossly each other. Each of the scoring areas 102 is respectively provided with ~~an~~ inductance coil 120. Each of coils 120 may be made
10 up of several turns and each turn is needed to form a predetermined shape in order to match the scoring areas 102. As matter of fact, the cross-section of each turn of the inductance coil 120 is smaller than that of scoring areas 102 to ensure that the coil 120 can be provided on the frame 100 completely. In addition, the inductance coil 120 is connected to a control unit of an electronic scoring means designed in the present dart
15 game (not shown) through cables 122, which can display signals collected from the scoring areas 102.

Various ~~score~~~~seore~~ are assigned to the scoring areas 102 in the dartboard. It is possible that some of areas 102 will be designated with~~evaluated~~ the same score. Preferably, a plurality of coils 120 of the present invention ~~corresponde~~~~responded~~ to
20 different scoring areas 102 representing the same score, and are wired together before being connected to the electronic means (not shown).

~~Referring to Fig. 5, the~~ The main body 110 of the dartboard is attached to the frame 100 and is used for being shot at by the dart 130. Therefore, the main body 110

should be made of bristle, natural fiber, synthetic fiber, plastic or combination~~the combination~~ thereof. In accordance with the present invention, the structure of the dartboard is substantially as simple as the traditional manual one and is easy to operate~~operation~~, as the inductance coils 120 can be directly provided on the frame 100. In addition, the frame 100 and main body 110 of the dartboard can be arranged in a flexible manner. Referring to Fig. 5, in the first preferred embodiment, the frame 100 provided with the inductance coil 120 of the present invention is arranged in front of the main body 110. In the second embodiment, as shown in Fig. 6, the frame 100 provided with the inductance coil 120 is arranged within the main body 110. Obviously, the frame 100 provided with inductance coil~~secoil~~ can be arranged in back of the main body 110, as shown in Fig. 7.

To achieve the object of the present invention, another essential part of the present invention is the dart 130, as shown in Fig. 8. The dart 130 usually comprises a point 132; a slender shaft 134 and a tail fin 136. Particularly, the dart 130 of the present invention is provided with a magnetic substance. That is, a slender shaft 134 and the point 132 can be magnetized respectively or be integrated and magnetized simultaneously.

When the dart 130 with a magnetic point 132 is shot onto the main body 110 of the dartboard, the instantaneous displacement of the magnetic point 132 through the coil 120~~102~~ induces a current or voltage signal on the coil 102 in accordance with Lenz's law; the signal can be amplified in a signal processor (not shown). Then the amplified electronic signal will be transmitted to an electronic scoring means (not

shown) to engage in calculation and display. Once the dart 130 is stuck on the dartboard, there is no more induction current.

Because the instantaneous electronic signal is induced only at the moment the magnetic point 132 of the dart 130 is moving through the coil 120+02, confusion in
5 electronic scoring can be avoided.

It is necessary to point out that the magnetic part of the dart 130 need
not~~needn't~~ go through the coil 120+30 completely; an electronic signal can be
inducted even when the dart 130 closing with the coil 120+30, as magnetic lines of
force around the dart 130 has already cut the coil 120+02, as shown in Fig. 5.

10 Furthermore, the electronic signal of the present invention intended to be
~~calculated in calculation~~ and ~~displayed display~~ is generated by magnetic lines of force
of the dart 130 cutting the coil 120+02 when the dart 130 is shot to go through the
object areas. The intensity of the electronic signal will depend on the elements, such
as the density of magnetic lines of force, turns of coil and rapidity for cutting magnetic
15 lines of force etc. In other words, the generated signal dimension is in direct
proportion with these elements. Therefore, the manner for enhancing the dart to
increase the density of magnetic lines of force or increasing turns of coil or increasing
rapidity of dart can be applied if the control unit of the present dart game requires a
rather large signal. Actually, it is better that the present invention need not
20 ~~providen~~~~needn't design~~ much more turns in coil, and thus costs for the present
invention can be reduced accordingly, as the rapidity of the dart will be large enough
to generate an available signal to be easily ~~collected easily~~. In another aspects, an
electronic signal ~~cannot can not~~ be generated when the rapidity of the dart through the

coil is lack, so the chances for erroneous ~~signal~~ to occur ~~are~~ is very slim, such as
when a player ~~removes~~ removing the dart from the dartboard. In other aspects, the
signal of the present invention will be generated at the moment the dart ~~hits~~ hitting the
dartboard and will disappear off the coil after the dart hitting the dartboard as the
5 rapidity at the moment is zero. Therefore, the method of scoring at each time for the
present invention is unique, even when the same object area is shot many times
without removing the ~~darts~~ dart from the area, the ~~signal~~ signal can be collected
~~accurately~~ exactly and the signal can be transmitted only from the coil surrounded the
dart ~~even though~~ however the point shot by the dart is adjacent to ~~other~~ another scoring
10 areas. Therefore, the method of the present invention for scoring is accurate and
applicable.

The above description should not be construed as limiting the scope of this
invention but as merely proving the illustration of some of the presently preferred
embodiments of the invention. For example, the dartboard in the present invention
15 and an electronic scoring means may be combined into one entity.